AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A method for determining a parameter for a piezoelectric actuator, the method comprising:

applying a drive signal to the piezoelectric actuator;

controlling the drive signal so that an ascertainable electrical charge is applied to the piezoelectric actuator;

operating the piezoelectric actuator;

obtaining a feedback signal from the piezoelectric actuator;

obtaining a voltage value from the feedback signal;

~~using the feedback signal to determine a capacitance of the piezoelectric actuator~~

using the electrical charge and the voltage value from the feedback signal to determine capacitance of the piezoelectric actuator.

2. (Original) The method of claim 1, wherein the step of operating the piezoelectric actuator comprises using the piezoelectric actuator to pump fluid in a pump

3. (Cancelled)

4. (Currently Amended) The method of claim ~~3~~1, further comprising:

deriving the drive signal from a pulse width modulated signal;

controlling pulse widths of the pulse width modulated signal so that the ascertainable electrical charge is applied to the piezoelectric actuator.

5. (Previously Presented) The method of claim 1, further comprising subsequently using the capacitance of the piezoelectric actuator to control the drive signal to the piezoelectric actuator.

6. (Currently Amended) The method of claim 5, further comprising subsequently using the capacitance of the piezoelectric actuator to control pulse widths of a pulse width modulated signal from which the drive signal is derived.

7. (Cancelled)

8. (Cancelled)

9. (Previously Presented) A method for determining a parameter for a piezoelectric actuator, the method comprising:

varying a drive signal applied to the piezoelectric actuator;

operating the piezoelectric actuator;

monitoring a feedback signal from the piezoelectric actuator as the drive signal is varied for an "echo";

determining a resonant frequency of the piezoelectric actuator as an inverse of a period of the echo.

10. (Original) The method of claim 9, further comprising varying the drive signal through a step function.

11. (Currently Amended) A drive circuit for sensing capacitance of a piezoelectric actuator operating in a device and for adjusting a drive signal of the piezoelectric actuator in accordance with the capacitance, wherein the drive circuit comprises:

a controller for controlling a drive signal applied to the piezoelectric actuator;

a feedback monitor for obtaining a feedback signal from the piezoelectric actuator while the piezoelectric actuator operates;

a processor for using the feedback signal to determine the capacitance of the piezoelectric actuator;

wherein the controller controls the drive signal so that an ascertainable electrical charge is applied to the piezoelectric actuator; wherein the feedback monitor obtains a voltage value from the feedback signal; and wherein the processor uses the electrical

charge and the voltage value from the feedback signal to determine the capacitance of the piezoelectric actuator.

12. (Cancelled)

13. (Currently Amended) The drive circuit of claim ~~12~~11, wherein the device is a pump and wherein the piezoelectric actuator operates to pump fluid in the pump.

14. (Cancelled)

15. (Currently Amended) The apparatus of claim ~~14~~11, wherein the drive circuit derives the drive signal from a pulse width modulated signal; and wherein the controller controls pulse widths of the pulse width modulated signal so that the ascertainable electrical charge is applied to the piezoelectric actuator.

16. (Currently Amended) The apparatus of claim ~~12~~11, wherein the controller subsequently uses the capacitance of the piezoelectric actuator to control the drive signal to the piezoelectric actuator.

17. (Previously Presented) The apparatus of claim 16, wherein the controller subsequently uses the capacitance of the piezoelectric actuator to control pulse widths of a pulse width modulated signal from which the drive signal is derived.

18. (Cancelled)

19. (Cancelled)

20. (Previously Presented) A drive circuit for sensing a parameter of a piezoelectric actuator operating in a device and for adjusting a drive signal of the piezoelectric actuator in accordance with the parameter, wherein the drive circuit comprises:

a controller for controlling a drive signal applied to the piezoelectric actuator;

a feedback monitor for obtaining a feedback signal from the piezoelectric actuator while the piezoelectric actuator operates; wherein the feedback monitor obtains the feedback signal as the drive signal is varied for an "echo";

a processor for using the feedback signal to determine the a resonant frequency of the piezoelectric actuator as an inverse of a period of the echo.

21. (Original) The apparatus of claim 20, wherein the controller varies the drive signal through a step function.

22. (Currently Amended) A drive circuit for sensing capacitance of a piezoelectric actuator operating in a device and for adjusting a drive signal of the piezoelectric actuator in accordance with the capacitance ~~The drive circuit of claim 12~~, wherein the drive circuit comprises:

means for applying a drive signal to the piezoelectric actuator;

means for obtaining a feedback signal from the piezoelectric actuator while the piezoelectric actuator operates;

means for using the feedback signal to determine a capacitance of the piezoelectric actuator;

wherein the means for applying controls the drive signal so that an ascertainable electrical charge is applied to the piezoelectric actuator; wherein means for obtaining obtains a voltage value from the feedback signal; and wherein the means for using uses the electrical charge and the voltage value from the feedback signal to determine the capacitance of the piezoelectric actuator.

23. (Cancelled)

24. (Previously Presented) The apparatus of claim 22, wherein the means for using determines the resonant frequency of the piezoelectric actuator as corresponding to the frequency in the range that had a minimum peak voltage value from the feedback signal.

25. (Previously Presented) A drive circuit for sensing a parameter of a piezoelectric actuator operating in a device and for adjusting a drive signal of the piezoelectric actuator in accordance with the parameter, wherein the drive circuit comprises:

means for applying and varying a drive signal to the piezoelectric actuator;

means for obtaining a feedback signal from the piezoelectric actuator while the piezoelectric actuator operates; wherein means for obtaining obtains the feedback signal as the drive signal is varied for an "echo";

means for using the feedback signal to determine a resonant frequency of the piezoelectric actuator as an inverse of a period of the echo.

26. (Currently Amended) A piezoelectrically-actuated device comprising:

a piezoelectric actuator which is responsive to a drive signal for pumping fluid between the inlet and outlet; and

a drive circuit for sensing a capacitance of the piezoelectric actuator and for adjusting a drive signal of the piezoelectric actuator in accordance with the capacitance, wherein the drive circuit comprises:

a controller for applying a drive signal to the piezoelectric actuator;

a feedback monitor for obtaining a feedback signal from the piezoelectric actuator while the piezoelectric actuator operates;

a processor for using the feedback signal to determine the capacitance of the piezoelectric actuator;

wherein the controller controls the drive signal so that an ascertainable electrical charge is applied to the piezoelectric actuator; wherein the feedback monitor obtains a voltage value from the feedback signal; and wherein the processor uses the electrical charge and the voltage value from the feedback signal to determine the capacitance of the piezoelectric actuator.

27. (Original) The apparatus of claim 26, wherein the device is a pump having a pump body for at least partially defining a pumping chamber having an inlet and an outlet which communicate with the pumping chamber, and wherein the piezoelectric actuator pumps fluid between the inlet and outlet.

28. (Cancelled)

29. (Cancelled)

30. (Currently Amended) The apparatus of claim ~~29~~26, wherein the drive circuit derives the drive signal from a pulse width modulated signal; and wherein the controller controls pulse widths of the pulse width modulated signal so that the ascertainable electrical charge is applied to the piezoelectric actuator.

31. (Previously Presented) The apparatus of claim 26, wherein the controller subsequently uses the capacitance of the piezoelectric actuator to control the drive signal to the piezoelectric actuator.

32. (Previously Presented) The apparatus of claim 31, wherein the controller subsequently uses the capacitance of the piezoelectric actuator to control pulse widths of a pulse width modulated signal from which the drive signal is derived.

33. (Currently Amended) The apparatus of claim ~~28~~26, wherein the controller varies the drive signal through a range of excitation frequencies; and wherein the output monitor obtains a voltage value from the feedback signal for each of the excitation frequencies; and wherein the processor determines a resonant frequency of the piezoelectric actuator as corresponding to a frequency in the range that had a minimum voltage value from the feedback signal.

34. (Original) The apparatus of claim 33, wherein the processor determines the resonant frequency of the piezoelectric actuator as corresponding to the frequency in the range that had a minimum peak voltage value from the feedback signal.

35. (Previously Presented) A piezoelectrically-actuated device comprising:

a piezoelectric actuator which is responsive to a drive signal for pumping fluid between the inlet and outlet; and

a drive circuit for sensing a parameter of the piezoelectric actuator and for adjusting a drive signal of the piezoelectric actuator in accordance with the parameter, wherein the drive circuit comprises:

a controller for applying a drive signal to the piezoelectric actuator;

a feedback monitor for obtaining a feedback signal from the piezoelectric actuator while the piezoelectric actuator operates;

a processor for using the feedback signal to determine the parameter of the piezoelectric actuator;

wherein the controller varies the drive signal; wherein the feedback monitor obtains the feedback signal as the drive signal is varied for an "echo"; and wherein the processor determines a resonant frequency of the piezoelectric actuator as an inverse of a period of the echo.

36. (Original) The apparatus of claim 35, wherein the controller varies the drive signal through a step function.